(54) Title: FINANCIAL DOCUMENT DISPENSING APPARATUS AND METHOD
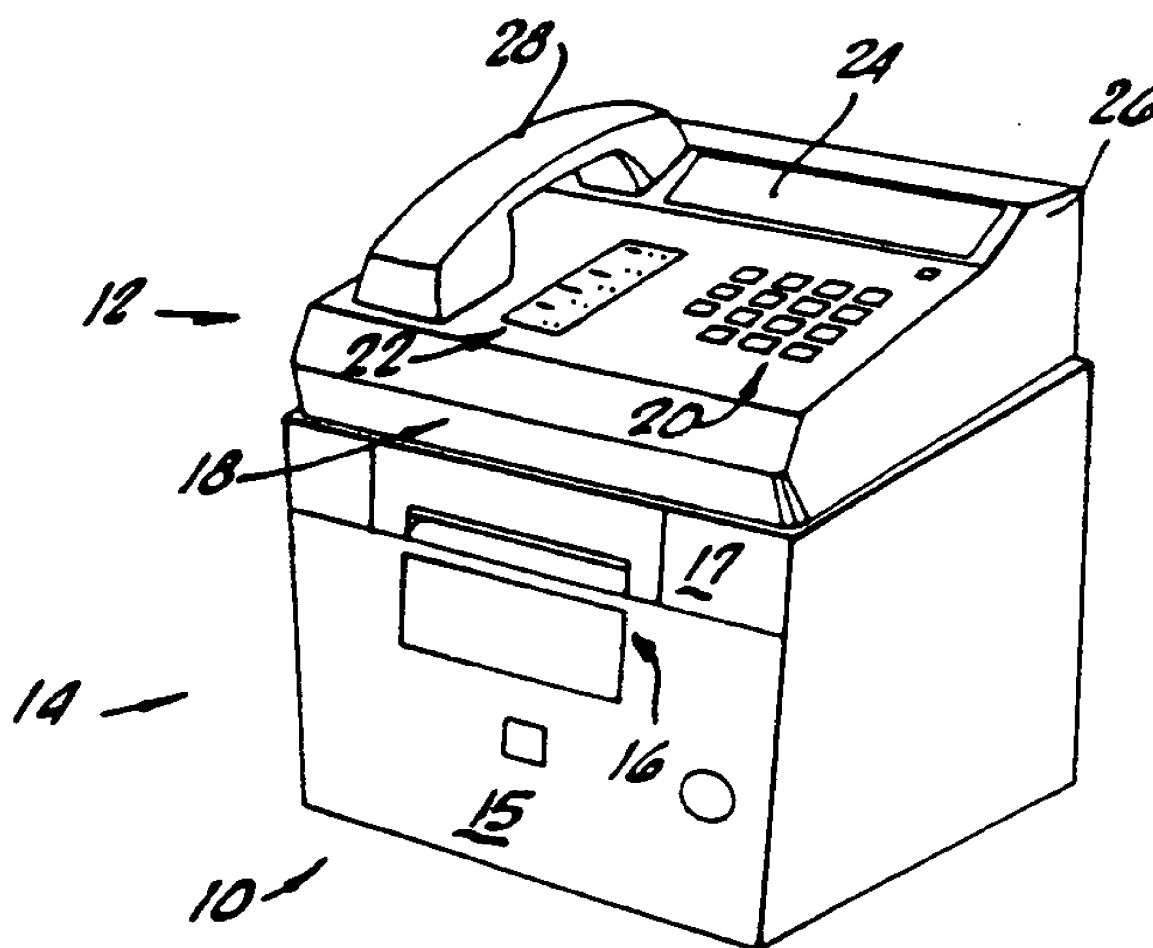
(57) Abstract

A dispenser (10) produces negotiable money orders, traveler's checks, and the like at remote locations and prints the check amount on the check while also printing summary data of a day's activities on a blank check form, eliminating the need for a separate printer and paper supply. The dispenser (10) prints the check amount using print icons that form a part of each character in the check amount, but are not as large as a complete character or as small as a dot print element. The check forms are connected together by perforation ties, and the dispenser (10) feeds the forms to the printer (14) such that the force with which the dispenser holds the forms is greater than the force needed to tear apart the forms, thus reducing the risk of unauthorized pulling of blank forms from the dispenser (10).

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FINANCIAL DOCUMENT DISPENSING APPARATUS AND METHOD

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to dispensing machines for financial documents and, more particularly, to an apparatus and method for dispensing negotiable money orders and traveler's checks, as well as non-negotiable credit card and debit card receipts, at a plurality of locations.

2. Description of the Related Art

A wide variety of dispensing machines are available for producing financial instruments such as debit card charges, money orders, and traveler's checks. Some machines must be manually operated, and typically include movable printing elements and a printing control arm. When a money order or check is to be printed, for example, a clerk places a blank form in the machine, positions the printing elements according to the requested amount, and actuates the printing control arm. The printing control arm causes the printing elements to be pressed against the blank form, imprinting the requested amount. After the clerk or other authorized person endorses the money order, it is negotiable and can be redeemed by the indicated payee.

Such manually operated machines are very slow, do not provide much security against forgery or unauthorized use, depend on manual entry and reporting, and require the presence of a clerk. Because a clerk is

5 required to operate the manual machine, a remote service location or after-hours service is impossible. Furthermore, transaction records must be manually entered to a data center or directly to the financial institution issuing the check. Accordingly, automatic dispensing

10 machines have been created in which the operator of the machine is the person who wants the completed money order or traveler's check, and in which transaction records are automatically provided to the issuing financial institution. Security against unauthorized use is

15 improved, and transaction records are more easily and accurately maintained.

Automatic dispensing machines are typically computer controlled and are connected to a data center or financial institution by communication lines over which

20 data is sent and received. In operation, a user's identity and bank account information is verified and then the user indicates the requested amount of the money order or traveler's check. After the computer system has verified the user's available funds, the requested amount

25 is printed on a blank, negotiable money order or traveler's check and the completed form is dispensed from the machine. At a predetermined time, typically the end of each business day, the machine prints out a summary of its day's transactions and provides the information to the

30 data center or financial institution.

While such automatic dispensing machines are an improvement on previous manual methods, such machines can be somewhat slow in printing. Often, such machines use printers with standard dot matrix-type print heads that

35 move along the length of the check and imprint the checks

with the check amount in what is commonly referred to as
portrait mode. In portrait mode, the print head travels
across the check and prints alphanumeric characters that
are readable in the direction of print head travel. That

5   is, the characters are printed to be readable along a line
that is perpendicular to the direction of paper travel.
Ordinarily, the printer receives ASCII-type data
designating the characters to be printed and includes the
necessary data to activate the proper dot matrix print

10   elements to form the characters and print them along the
check and across the direction of paper travel. Thus, for
example, the printer simply requires the 8-bit ASCII code
for the letter "A" to print an "A" in portrait mode.

        Alternatively, the checks can be dispensed

15   lengthwise in what is commonly referred to as landscape
mode. In landscape mode, the characters are printed to be
readable along a line that is parallel to the direction of
paper travel. Print heads must print across the direction
of paper travel. Therefore, to print in landscape mode,

20   a printer must perform a conversion routine to essentially
rotate the characters relative to the line of printing so
they come out on the paper so as to be readable in the
direction of paper travel. Printing in landscape mode is
not especially quick because of the conversion process and

25   is often much slower than printing in portrait mode.

        As an alternative to printing in portrait or
landscape mode, the characters can be printed in what is
known as graphics mode. In graphics mode, the character
information provided to the printer indicates the

30   particular dot matrix print elements that will be
activated for printing. This is ordinarily used for
printing graphic images from a video screen, for example,
and is even slower than landscape mode. Graphics mode
does not deal with a regular set of alphanumeric data,

35   where the input for the letter "A" is simply the 8-bit

ASCII code for an "A", but is a lengthy string of bits for activation of the proper individual printing elements. This mode is sometimes used when large, over-sized characters are desired in addition to conventional ASCII

5　character sets. Graphics mode is typically even slower than landscape mode. The data sent to the printer in graphics mode is of relatively low information density when compared to the character-oriented portrait mode. Faster printing times would improve the performance of

10　such automatic dispensing machines.

One of the advantages of automatic dispensing machines is that they automatically keep track of transaction data and periodically print out a summary of the day's transactions to provide a written record.

15　Conventionally, a second printer is provided in the dispenser and prints a transaction summary in portrait mode on a roll of blank paper. Unfortunately, this means the dispensing machine must be loaded with both blank check forms and transaction summary paper. This requires

20　inefficient duplication of printing elements and two kinds of paper supply.

Finally, automatic money order dispensing machines are not immune from tampering. Blank check forms are most conveniently provided as a series of checks

25　separated by perforations and arranged in a fan-fold stack. When an imprinted check is being dispensed from the machine, one end of the check can be grabbed hold of and the stack of checks can be pulled out quickly before the dispenser has stopped the paper advancement. Extra

30　blank check forms can sometimes be retrieved in this way and the blank checks can be filled in with desired amounts and then cashed by unwary clerks. Because the dispensing machines do not require a clerk for operation, such tampering can be carried out without the immediate

35　knowledge of authorized personnel. While missing checks

can be tracked by their serial numbers, the tampering
might easily escape detection until the unauthorized
checks have been cashed.

From the foregoing discussion, it should be
apparent that there is a need for an automatic dispensing
machine that can be used at a plurality of separate
locations, can quickly and accurately print the necessary
data on the face of a blank form, can print transaction
summaries, and can do so without inefficient duplication
of elements and supplies. The present invention satisfies
this need.

SUMMARY OF THE INVENTION

The present invention is embodied in a
dispensing machine that can be placed at remote locations
and that quickly prints characters on negotiable check
draft and non-negotiable charge receipt blank forms and,
at the end of a predetermined period of time, prints out
machine activity reports on a blank form, eliminating the
need for a second printer and paper supply for the
reports. Preferably, the drafts and receipts are
dispensed lengthwise, and printing is carried out with the
draft or charge amount printed along the length of the
form in landscape mode and activity reports printed across
the form in portrait mode.

The blank forms are advantageously provided in
a continuous fan-fold stack, individual forms being
connected together at their ends by perforation ties that
can be pulled apart. In another aspect of the invention,
the printer uses a paper feed mechanism in which the force
with which the paper is held by the paper feed mechanism
during printing and paper advancement with a force that is
set to be greater than the force needed to pull apart the
forms. Thus, anyone attempting to pull out several blank

forms from the dispensing end during the printing process
will only succeed in pulling out a single form, which will
not be properly completed or will be completed with only
the requested amount. All other blank forms will remain
5   in the printer.

The amount of a check that is to be cashed is
preferably printed in oversized characters using print
character icons rather than standard alphanumeric
characters in landscape mode or oversized characters using
10   dot matrix patterns in graphics mode. The print icons are
portions of complete characters, not as small as the
individual dot elements of a dot matrix printer such as
must be specified in graphics mode or as complete as the
alphanumeric characters of an ASCII character set such as
15   must be specified in landscape mode. Rather, a number of
the icons can be combined to form the desired complete
characters. This allows printing to proceed more quickly
than using graphics data or printing characters in
landscape mode.

20   The dispensing machine includes a digital
processor for processing user commands and controlling
machine operation, and comprises a terminal connected to
a data center or a financial institution to request
account balance inquiries, send activity data, and send
25   and receive various other data and commands. As many
dispensing machines can be connected to the data center as
can be accommodated by the data center itself. The
machine also includes a keyboard for entering input data
and a display screen for displaying system messages,
30   entered data, and instructions.

Preferably, the fan-fold check forms are
provided with alignment holes at the form ends. The
printer checks for the presence of a hole and thereby
aligns the forms properly relative to the printing

-7-

elements. This is superior to conventional black stripe detectors because more expensive reflective sensors as used with such detectors are not necessary, and instead relatively simple light detectors or mechanical elements

5   can be used. Extra security is also provided because such alignment holes easily provide speed data to the dispenser. If the dispenser becomes aware that paper is travelling at a faster rate than normal, indicating that someone is attempting to pull out blank checks, the

10   dispenser can lock the paper against advancement.

Other features and advantages of the present invention should be apparent from the following description of the preferred embodiment, which illustrates, by way of example, the principles of the

15   invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an automatic money order/traveler's check dispenser in accordance with the present invention.

20   FIG. 2 is a block diagram of the dispenser shown in FIG. 1.

FIG. 3 is a partial cut-away view of the printer showing of checks as they are dispensed from the dispenser shown in FIG. 1.

25   FIG. 4 is a diagram of the letters X, Y, and Z and also the printing icons printed by the print head of the dispenser shown in FIG. 1.

FIG. 5 is the numeral "8" as printed using the print icons shown in FIG. 4.

FIG. 6 is an enlarged and exaggerated representation of two of the printing icons shown in FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

5   Referring to FIG. 1, an automatic money order/traveler's check dispensing machine 10 constructed in accordance with the present invention includes a communications terminal 12 and a printer unit 14. The communications terminal communicates with a data center or
10   a financial institution to process transaction data generated by operation of the machine. A user enters data, including account identification and the requested check amount, through the communications terminal. After the machine performs user identity and account
15   verification, the printer unit prints the requested check amount onto a blank check form stored within the printer unit and dispenses the completed check lengthwise from a dispensing slot 16. At the end of a predetermined time interval, such as at the end of a business day, the
20   printer unit causes a transaction summary to be printed onto one or more of the blank check forms. Thus, a single printer and paper supply are used for printing both checks and transaction summaries. This reduces the cost of the dispensing machine and also reduces the cost of supplies.

25   The communications terminal 12 includes a keyboard 18 with a numeric keypad 20 and assorted function keys 22 that are used for entering check requests and transaction data. The terminal is provided with a display 24 at which entered data, system commands, and
30   instructions are displayed. Data also can be entered by using a card slot 26, which receives magnetic cards that are encoded with data. Finally, a telephone handset 28 is provided for direct verbal communication with personnel at

the data center. Telephone dialing is accomplished with
the keypad 20 or automatically using pre-programmed keys.

The printer unit 14 includes a base 15 that
receives a plurality of blank forms with pertinent data
5   pre-printed on the forms. A pivotable cover or lid 17
provides access to the interior of the base so that fan-
fold stacks of blank forms can be placed in the base.
When additional blank forms are to be loaded, the
communications terminal 12 can be lifted from where it
10 conveniently rests on the printer unit 14, as illustrated
in FIG. 1. After the lid 17 is raised and the blank forms
are loaded, the lid can be closed and, if desired, the
communications terminal can be placed on the printer unit
once again.

15 A better understanding of the dispensing machine
operation can be gained by referring to FIG. 2, which is
a block diagram that shows the dispensing machine 10
connected to a printer 14 and to a host data center or
financial institution 30. Each dispensing machine
20 includes a processor 32 that receives operator input data
from the keyboard 18 or card slot 26. The processor
communicates with the host computer 30 via a modem 34 and
a communications line 36, which allows the dispensing
machine to communicate with the host computer to send and
25 receive transaction data, commands, and other necessary
information.

The dispensing machine 10 also includes a card
reader 38 through which the dispensing machine accepts
information encoded on a magnetic card that is passed
30 through the card slot 26 illustrated in FIG. 1. The card
reader reads the information that is magnetically encoded
on the card, such as identification data and card
expiration status. The card reader can be used, for
example, to charge a user's credit card or debit card for

the amount of dispensed checks. Thus, a user can obtain traveler's checks in amounts greater than the user's cash-on-hand. If the user requests checks in an amount greater than the user's credit limit, the dispensing machine halts processing and indicates an error on the display 24. The dispenser 10 further includes a memory unit 40 that stores transaction data, acceptable security codes, and other data necessary for operation of the system.

The printer 14 is connected to the dispenser by a printer cable 42. The processor 32 organizes the data to be printed into the proper format, whether it is check amount data or transaction summary data. As noted, the check amount is printed using icons. The processor accepts the check amount indicated from the keyboard 18, formats it into the proper representation, and provides it to the printer 14 via the printer cable 42. The processor 32 also performs various administrative functions, such as beginning operation by accepting security code data from authorized personnel, verifying user identification, and controlling the periodic summary transaction reports delivered to the host computer.

A completed check 50 is shown being dispensed from the printer 14 in FIG. 3. The check is a multiple-part form comprising an original top layer 52 and a duplicate non-negotiable form 54 backing layer that is retained as a receipt by the customer. Preferably, a carbonless paper multiple-part form is used, eliminating the need to dispose of waste carbon layers and reducing the chances of copies being smudged. The check forms are provided in a continuous fan-fold stack in which individual forms 50 and 51 are connected by perforation ties 56. Strips of paper 57 with sprocket-receiving holes are attached by perforations to the top and bottom edges of the check forms. A tractor feed mechanism, known to those skilled in the art, is used to advance the forms

through the printer, but other printer mechanisms, such as friction feed, can also be used.

As noted above, using blank check forms to print
both completed checks and transaction summaries reduces
5   the cost of the apparatus 10 and the cost of supplies. Using multiple-part forms, such as illustrated in FIG. 3, further provides transaction summaries that are easier to read. Generally, the top layer 52 of a multiple-part form includes identifying marks, patterns, watermarks, printed
10 information, and the like that are absent from the backing layer 54, which can comprise a blank sheet. The contrast between the printed characters and the paper is thereby improved. Thus, characters that are impressed from the printer 14 onto the backing layer generally can be more
15 easily read than characters that are printed on the top layer. Thus, the backing layers of multiple-part forms provide an easily read copy of the transaction summaries.

FIG. 3 shows that the check amount is printed
lengthwise along the check, parallel to the top edge 58
20 and bottom edge 60 of the check. Printing is performed by a dot matrix print head 62 having a plurality of printing elements extending across the check. The print head 62 comprises a single row of four printing elements, or pins, providing a resolution of, for example, 64 dots per inch
25 (DPI). It should be understood that other print head configurations can also be used. The print head 62 is supported above a blank check form 51 by two rails 63, along which the print head is swept back and forth across the check while the printing elements are selectively
30 activated. In this way, dots that form characters and images can be printed on the check.

As noted, the printer 14 can include either a conventional friction feed or tractor feed mechanism advancing the check forms past the print head 62. In

either case, the forms 51 are held as they are advanced
with a force that is greater than the force needed to
break the perforation ties 56.   In this way, anyone
attempting to pull extra blank forms out of the printer 14
5   when a check is being printed will only succeed in pulling
out the single completed check 50, and the remaining blank
checks will stay in the printer.

Because checks are removed from the printer
unit 14 as they come out of the slot 16, the forward
10   edge 64 of a check 50 is the first edge to leave the
printer.   The rear edge 66 of the check is adjacent with
the next appearing blank check form 51.   One end of the
check is provided with an alignment hole, such as the hole
68 shown near the rear edge 66.   The alignment hole is
15   used by a sensor 70 to detect the end of a check form and
monitor both the registration of the check relative to the
print head 62 and the paper speed of the checks being
printed.   A forward alignment hole 69 can be provided
alternatively or additionally to check for the forward
20   edge of the forms.   In this way, printing can begin with
the very first form in the stack.

The sensor 70 is preferably a simple optical
sensor that receives light from a light source (not
illustrated) when an alignment hole 68 or 69 is positioned
25   between the light source and the sensor.   When the sensor
detects an alignment hole, it provides a signal to the
processor 32, which causes feeding of check forms to stop
in a position that gives proper registration to the forms
relative to the print head 62 so that printing will occur
30   on the proper blank lines of the check 51.   The sensor 70
is also used to prevent tampering.   Depending on the
number of checks requested, printing can proceed at up to
approximately eight checks per minute.   The sensor 70
provides a signal to the processor as each check is
35   printed, and therefore the processor can quickly determine

if a check has passed by faster than possible by printing
with the print head 62. This indicates tampering, and the
processor responds to such an indication by locking the
feed mechanism with a pair of solenoids 72.

5   FIG. 4 illustrates the sixteen character icons
102-132 used in printing the checks 50, preceded by three
alphanumeric characters X, Y, and Z, printed in portrait
mode by the printer unit 14. FIG. 5 shows the numeral 8,
printed using the icons. The icons are created by
10   providing the printer with data that will form the desired
icons. Conventional print head assemblies include memory
for the storage of data that will form standard
characters. The icon data is stored in one of two ways,
depending on the capabilities of the printer unit 14.

15   Many printers are capable of supporting only a
standard ASCII character set, which consists of
approximately 128 characters. Many of these characters
are seldom used. If the printer unit 14 has only such
128-character capability, then the icons are created by
20   replacing the character data corresponding to some of the
ASCII-standard but seldom-used alphanumeric characters
with icon data. More specifically, standard software code
supplied with a commercially available dot matrix printer
assembly includes stored data that causes the printing of
25   the particular dot pattern associated with each character
of a standard ASCII alphanumeric character set. The icon
character set of the preferred embodiment includes sixteen
icons. Therefore, in accordance with the present
invention, the data for sixteen of the ASCII characters is
30   replaced with the data for the sixteen icons 102-132.
When the printer unit 14 is instructed by the processor 32
(FIG. 2) to print one of the sixteen replaced characters,
an appropriate icon is printed instead. In this way, the
printer unit operates as it otherwise would when printing

a standard alphanumeric character in portrait mode, but
instead prints an icon.

For example, the character "&" is not ordinarily
used in printing machine activity data. Therefore, the
5   stored data ordinarily used by the printer 14 for
generating the "&" character is replaced with the data for
one of the icons 102-132 and the printer is instructed to
print that character when the icon is desired. The icons
can be used to print characters that are oriented as if
10   printed in the landscape mode, so they can be read
lengthwise along the check, even though the printing is
actually carried out in portrait mode. By organizing the
print data in this way, the printing of checks can proceed
faster than if alphanumeric data were sent to the printer
15   for printing or if graphic data were provided to the
printer for printing in graphics mode.

Some of the more advanced printer assemblies
available are capable of supporting a 256-character
alphanumeric set. Such a printer therefore supports
20   approximately 128 characters in addition to the standard
128 ASCII characters. If the printer unit 14 has a 256-
character capability, then the icon data can be stored in
the printer memory for the unused 128 non-ASCII
characters. Regardless of the printer capability, those
25   skilled in the art will recognize that a great number of
icons can be supported by printer units of either
capability described above. In the preferred embodiment,
however, only sixteen icons are necessary.

FIG. 6 illustrates two of the print icons 102
30   and 104 shown in FIG. 4, but in greater detail and with
the distance between the dots made by the printing
elements exaggerated for clarity. The maximum allowable
print area is seven dots high by eight dots wide. Because
the print head 62 (FIG. 3) includes eight printing

elements, the icons 102-132 are created in up to two passes of the print head, as are conventional alphanumeric characters in portrait mode. Forming the desired alphanumeric characters, oriented as if printed in

5   landscape mode, is simply a matter of providing the printer with instructions to print the proper sequence of standard portrait mode keyboard characters whose print data have been replaced with the icon print data. Thus, although from the printer's perspective the printing is

10 being done in portrait mode, the characters actually come out in landscape orientation. Because the portrait mode is used, printing proceeds more quickly than if graphics mode was used. When activity data is printed, the data is printed using the standard ASCII input characters in

15 portrait mode, which are smaller in size and require only one pass of the print head 62 to print. The check amount characters, such as shown in FIG. 5, can require up to five passes of the print head. In this way, a greater amount of activity information can be printed than if the

20 information were printed lengthwise with larger characters.

Those skilled in the art will appreciate that the dispenser 10 can be used for producing debit charge and credit card receipts in addition to producing

25 negotiable financial instruments such as money orders and traveler's checks. The blank forms used by the dispenser would likely be changed to print credit card receipts, but the structural details of the dispenser would remain the same and the advantages discussed above would be obtained.

30   An automatic negotiable draft and non-negotiable receipt dispenser in accordance with the present invention provides a terminal that communicates with a data center or financial institution and a printer that prints out completed drafts and receipts on blank forms using print

35 icons that create alphanumeric characters lengthwise along

the forms and that also prints out transaction summary
reports in portrait mode on blank forms. The forms used
to print out the transaction summary reports are voided.
Using the same printer and the same paper supply to print
5   out completed drafts or receipts and transaction summary
reports reduces the number of elements needed for the
printer and reduces the supply costs. A processor
contained within the terminal advantageously tends to
switching between completed-form printing and transaction
10   summary printing modes.

Appendix A is the assembly code listing for the
data needed to generate the print icons 102-132 shown in
FIG. 4. Large-size and medium-size numerals are provided
by the code. The reference to landscape mode refers to
15   the orientation of the printed characters and not to the
printing mode. The characters are printed with the
printer unit 14 in portrait mode.

The present invention has been described above
in terms of presently preferred embodiments so that an
20   understanding of the present invention can be conveyed.
There are, however, many configurations for dispensing
machines not specifically described herein, but with which
the present invention is applicable. The present
invention should therefore not be seen as limited to the
25   particular embodiments described herein, but rather it
should be understood that the present invention has wide
applicability with respect to dispensing machines. Such
other configurations can be achieved by those skilled in
the art in view of the description herein.

APPENDIX A

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;---
----
5   ; string of characters to form
     ; large zero in landscape mode

```
     LANDOL:  DB    88H         ;column 1
              DB    89H
              DB    89H
10            DB    89H
              DB    89H
              DB    8EH

              DB    87H         ;column 2
              DB    FC
15            DB    FC
              DB    FC
              DB    80H

              DB    86H         ;column 3
              DB    85H
20            DB    85H
              DB    85H
              DB    84H

              DB    'zero '     ;column 4
              DB    ENDDEL      ;end delimiter
```

25   ;---

     ;string of characters to form
             ;large one in landscape mode

```
        LAND1L:
                DB      8CH             ;column 1
                DB      85H
                DB      85H
    5           DB      85H
                DB      8BH
                DB      8AH
                DB      20H             ;column 2
                DB      20H
    10              DB      20H
                DB      20H
                DB      20H


                DB      87H             ;column 3
                DB      20H
    15          DB      20H
                DB      20H
                DB      20H


                DB      'one '                  ;column 4
                DB      ENDDEL                  ;end delimiter

    20  ; - - - - - - - - - - - - - - - - - - - - - - - - - - E N D
        ONE-----------------------------------------------
                ;string of characters to form
                    ;large two in landscape mode


        LAND2L: DB      8FH             ;column 1
    25      DB      89H
                DB      8EH
            DB      20H
            DB      8EH


                DB      87H             ;column 2
    30      DB      20H
            DB      80H
            DB      20H
```

```
              DB      80H


              DB      87H          ;column 3
              DB      20H
              DB      80H
     5        DB      85H
              DB      84H


              DB      'two  '          ;column 4
              DB      ENDEL            ;end delimiter


         ; - - - - - - - - - - - - - - - - - - - - - - - - - E N D
    10   TWO----------------------------------------
              ;string of characters to form
                  ;large three in landscape mode


         LAND3L:  DB    88H           ;column 1
              DB      20H
    15        DB     20H
              DB      20H
              DB      8EH


              DB      87H          ;column 2
              DB      20H
    20        DB      FCH
              DB      20H
              DB      80H


              DB      86H          ;column 3
              DB      85H
    25        DB      FB4
              DB      85H
              DB      84H


              DB      'three'          ;column 4
              DB      ENDDEL           ;end delimiter
```

```
        ; - - - - - - - - - - - - - - - - - - - - - - - E N D
        THREE------------------------------------------
              ;string of characters to form
                  ;large four in landscape mode

  5     LAND4L:   DB    20H         ;column 1
              DB    80H
              DB    83H
              DB    82H
              DB    20H


  10          DB    20H       ;column 2
              DB    80H
              DB    20H
              DB    81H
              DB    82H


  15          DB    94H       ;column 3
              DB    94H
              DB    89H
              DB    89H
              DB    89H


  20          DB    'four '       ;column 4
              DB    ENDDEL        ;end delimiter


        ; - - - - - - - - - - - - - - - - - - - - - - - E N D
        FOUR-------------------------------------------
              ;string of characters to form
  25              ;large five in landscape mode

        LAND5L:   DB    88H         ;column 1
              DB    20H
                    DB    80H
              DB    89H
  30          DB    9AH
```

```
          DB     87H          ;column 2
          DB     20H
          DB     80H
          DB     20H
   5      DB     80H


          DB     86H          ;column 3
          DB     85H
          DB     84H
          DB     20H
  10      DB     80H


          DB     'five '          'column 4
          DB     ENDDEL           'end delimiter


   ; - - - - - - - - - - - - - - - - - - - - - - - - - - - - E N D
          FIVE------------------------------------------
  15      ;string of characters to form
          ;large six in landscape mode


   LAND6L:  DB   88H          ;column 1
          DB     89H
                 DB     9AH
  20      DB     89H
          DB     8EH


          DB     87H          'column 2
          DB     20H
          DB     80H
  25      DB     20H
          DB     80H


          DB     86H          ;column 3
          DB     85H
          DB     84H
  30      DB     20H
          DB     84H
```

```
        DB    'six '          ;column 4
        DB    ENDDEL          ;end delimiter


    ; - - - - - - - - - - - - - - - - - - - - - - - - E N D
        SIX------------------------------------------
  5             ;string of characters to form
                    ;large seven in landscape mode


        LAND7L:   DB    20H         ;column 1
            DB    20H
            DB    20H
 10     DB    20H
        DB    80H


        DB    89H         ;column 2
        DB    82H
        DB    20H
 15     DB    20H
        DB    80H
        DB    20H         ;column 3
        DB    20H
        DB    82H
 20     DB    85H
        DB    84H


        DB    'seven'         ;column 4
        DB    ENDDEL          'end delimiter


    ; - - - - - - - - - - - - - - - - - - - - - - - - E N D
 25     SEVEN------------------------------------------
                ;string of characters to form
                    ;large eight in landscape mode


        LAND8L:   DB    88H         ;column 1
            DB    89H
 30         DB    9AH
        DB    89H
```

```
            DB      8EH


            DB      87H             ;column 2
            DB      20H
            DB      80H
    5       DB      20H
            DB      80H


            DB      86H             ;column 3
            DB      85H
            DB      9BH
   10       DB      85H
            DB      84H


            DB      'eight'         ;column 4
            DB      ENDDEL          ;end delimiter


        ; - - - - - - - - - - - - - - - - - - - - - - - - E N D
   15   EIGHT------------------------------------------

                ;string of characters to form
                    ;large nine in landscape mode


        LAND9L:     DB   88H            ;column 1
                    DB   20H
   20               DB   88H
            DB      89H
            DB      8EH


            DB      87H             ;column 2
            DB      20H
   25       DB      87H
            DB      20H
            DB      80H


            DB      86H             ;column 3
            DB      85H
   30       DB      8CH
```

```
            DB     85H
            DB     84H


            DB     'nine '           ;column 4
            DB     ENDDEL            ;end delimiter


  5    ; - - - - - - - - - - - - - - - - - - - - - - - - E N D
       NINE-------------------------------------------
            ;string of characters to form
                 ;medium zero in landscape mode


       LANDOM:   DB    88H           ;column 1
 10         DB     89H
                 DB    8EH


            DB     86H          ;column 2
            DB     85H
            DB     84H
 15         DB     ENDDEL            ;end delimiter


       ; - - - - - - - - - - - - - - - - - - - - - - E N D    M
       ZERO-------------------------------------------
            ;string of characters to form
                 ;medium one in landscape mode


 20    LAND1M:   DB    85H           ;column 1
            DB     85H
                 DB    8BH


            DB     20H          ;column 2
            DB     20H
 25         DB     20H
            DB     ENDDEL            ;end delimiter


       ; - - - - - - - - - - - - - - - - - - - - - - - E N D    M
       ONE--------------------------------------------
            ;string of characters to form
```

```
                  ;medium two in landscape mode


        LAND2M:   DB    8FH          ;column 1
              DB    87H
                    DB    8EH


   5          DB    87H        ;column 2
              DB    86H
              DB    84H
              DB    ENDDEL            ;end delimiter


        ; - - - - - - - - - - - - - - - - - - - - - - - - E N D    M
  10    TWO------------------------------------------
              ;string of characters to form
                    ;medium three in landscape mode


        LAND3M:   DB    88H          ;column 1
              DB    20H
  15                DB    80H
```

```
              DB    86H          ;column 2
              DB    84H
              DB    81H
              DB    ENDDEL            ;end delimiter


  20    ; - - - - - - - - - - - - - - - - - - - - - - - - E N D    M
        THREE------------------------------------------
              ;string of characters to form
                    ;medium four in landscape mode


        LAND4M:   DB    20H          ;column 1
  25          DB    8AH
                    DB    20H


              DB    85H        ;column 2
              DB    9CH
              DB    8BH
```

```
        DB    ENDDEL              ;end delimiter


    ; - - - - - - - - - - - - - - - - - - - - - - - - E N D    M
    FOUR---------------------------------------------
        ;string of characters to form
5               ;medium five in landscape mode


    LAND5M:    DB    88H           ;column 1
        DB    80H
        DB    9AH


        DB    86H          ;column 2
10      DB    84H
        DB    80H
        DB    ENDDEL              ;end delimiter


    ; - - - - - - - - - - - - - - - - - - - - - - - - E N D    M
    FIVE---------------------------------------------
15      ;string of characters to form
                ;medium six in landscape mode


    LAND6M:    DB    88H           ;column 1
        DB    9AH
        DB    8EH


20      DB    86H          ;column 2
        DB    84H
        DB    84H
        DB    ENDDEL              ;end delimiter.


    ; - - - - - - - - - - - - - - - - - - - - - - - - E N D    M
25  SIX---------------------------------------------
        ;string of characters to form
                ;medium seven in landscape mode


    LAND7M:    DB    20H           ;column 1
        DB    20H
```

```
                DB    80H


          DB    89H           ;column 2
          DB    89H
          DB    81H
5         DB    ENDDEL        ;end delimiter


     ; - - - - - - - - - - - - - - - - - - - - - E N D    M
       SEVEN------------------------------------------
          ;string of characters to form
              ;medium eight in landscape mode


10   LAND8M:   DB    88H           ;column 1
          DB    9AH
              DB    8EH


          DB    86H           ;column 2
          DB    9BH
15        DB    84H
          DB    ENDDEL            ;end delimiter


     ; - - - - - - - - - - - - - - - - - - - - - E N D    M
       EIGHT------------------------------------------
          ;string of characters to form
20            ;medium nine in landscape mode


     LAND9M:   DB    88H           ;column 1
          DB    80H
              DB    8EH


          DB    86H           ;column 2
25        DB    9BH
          DB    84H
          DB    ENDDEL            ;end delimiter
```

I claim:

1.   A dispenser for producing negotiable checks
and the like from blank forms at a remote location,
comprising:

processing means for controlling the
5   operation of the dispenser and for communicating with a
data center;

a keyboard, connected to the processing
means, that is used by a dispenser operator to provide
transaction data, including a requested check amount, to
10   the processing means;

display means for displaying the
transaction data entered at the keyboard;

memory means for storing the transaction
data entered at the keyboard and for storing operations
15   carried out by the processing means;

a plurality of blank forms that are stored
in the dispenser;

printing means for printing the requested
check amount on a blank form and for printing an activity
20   summary of the transaction data, check amounts, commands,
and operations stored in the memory means during a
predetermined time interval on a blank form; and

communication means for sending a summary
of the transaction data and operations stored in the
25   memory means during a predetermined time interval to the
data center.

2.   A dispenser as defined in claim 1, wherein
the printing means prints the check amount lengthwise
along the blank form and prints the activity summary
across the blank form from top edge to bottom edge.

3.   A dispenser as defined in claim 2, wherein
the printing means prints the check amount using print

icons that individually form a part of characters in the check amount.

4.   A dispenser as defined in claim 1, wherein the blank forms comprise individual forms connected together by perforation ties between forms in a fan-fold arrangement;

5   and wherein the dispenser includes feed means for holding the forms while feeding them to the printing means such that the force with which the feed means holds the forms is greater than the force required to break the perforation ties between forms.

5.   A dispenser as defined in claim 1, wherein the blank forms comprise individual forms connected together in a fan-fold arrangement with at least one alignment hole located near one end of each form;

5   wherein the dispenser includes feed means for holding the forms while feeding them to the printing means;

              and wherein the dispenser further includes sensor means for sensing the presence of an alignment hole

10   and causing the feed means to stop the feeding of the forms at the proper registration relative to the printing means for proper printing of the check amount and for sensing when the alignment holes are moving faster than normal, and for responding to faster than normal movement

15   by stopping the feeding of the blank forms.

6.   A dispenser as defined in claim 1, wherein the dispenser includes a telephone handset that provides verbal communication with the data center.

7.   A dispenser as defined in claim 1, wherein the dispenser further includes a magnetic card reader that accepts magnetically encoded cards and reads the encoded information thereon.

8.   A dispenser for producing negotiable checks
and the like at a remote location, comprising:

keyboard means, having a plurality of data
entry keys, for producing transaction data and operating
5   commands in response to operator input commands entered
via the data entry keys;

a display that displays the data and
commands entered at the keyboard means;

memory means for storing the transaction
10   data and commands entered at the keyboard means and for
storing operations carried out by the dispenser;

a plurality of check forms stored in the
dispenser;

printing means for printing a blank check
15   with a check amount derived from the transaction data and
for printing a blank check with an activity summary of the
transaction data, commands, and operations that are stored
in the memory means during a predetermined time interval;
and

20   control means for controlling the operation
of the dispenser and for communicating with a remote data
center to periodically send the activity summary of the
check amounts, transaction data, commands, and operations
stored in the memory means during a predetermined time
25   interval;

wherein the printing means prints the check
amount lengthwise along the check using print icons that
individually form a part of each character of the
transaction data and together form the characters making
30   up the check amount.

9.   A dispenser as defined in claim 8, wherein
the printing means is capable of printing in portrait mode
and in landscape mode, and prints both the print icons and
activity summary in portrait mode.

10. A dispenser as defined in claim 9, wherein the print code for predetermined standard portrait mode characters is replaced with the print code for the print icons.

11. A dispenser as defined in claim 8, wherein the check forms comprise individual forms connected together by perforation ties between forms in a fan-fold arrangement; and

5   wherein the dispenser includes feed means for holding the forms and feeding them to the printing means such that the force with which the feed means holds the forms is less than the force required to break the perforations between forms.

12. A method for printing check amounts onto blank checks to be dispensed from a dispensing machine having a printer, comprising the steps of:

          accepting a requested check amount from a
5   machine operator;

          generating alphanumeric characters corresponding to the requested check amount;

          generating icon print data for icons corresponding to the alphanumeric characters;

10   providing the icon print data to the printer; and

          imprinting blank checks with the requested check amounts.

13. A method for printing checks as defined in claim 12, further comprising the steps of:

          storing transaction data including requested check amounts during a predetermined interval of

5   time;

          periodically providing the transaction data to the printer; and

printing the transaction data on blank
checks.

14.   A method for printing checks as defined in
claim 12, wherein the step of accepting a requested check
amount includes the steps of:

accepting a magnetically encoded card and
5   reading the encoded information to determine a user's
available charge or debit amount; and

indicating an error condition if the
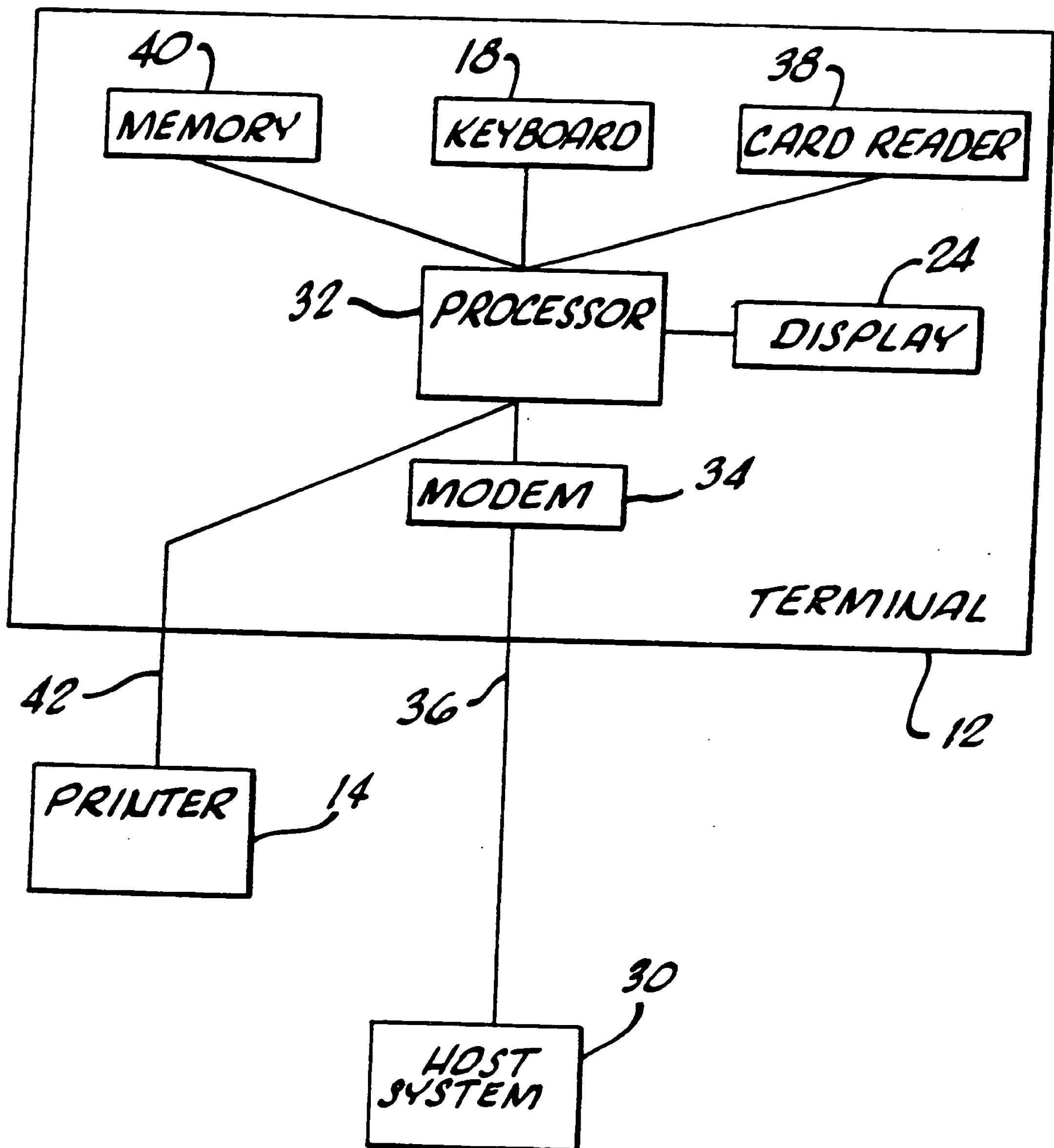requested check amount is greater than the available
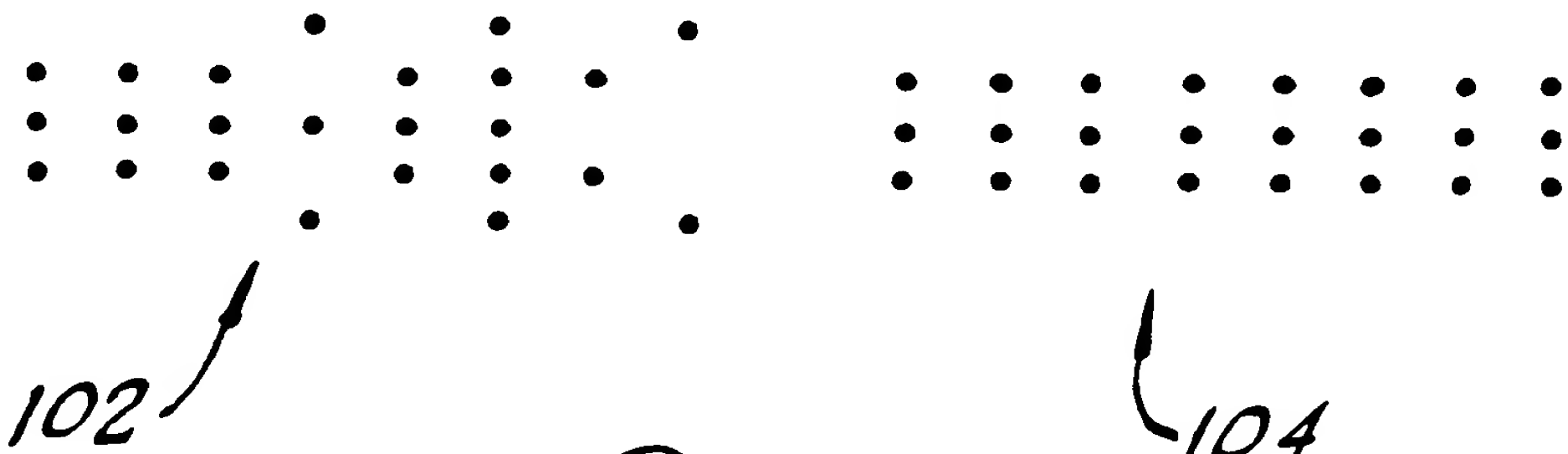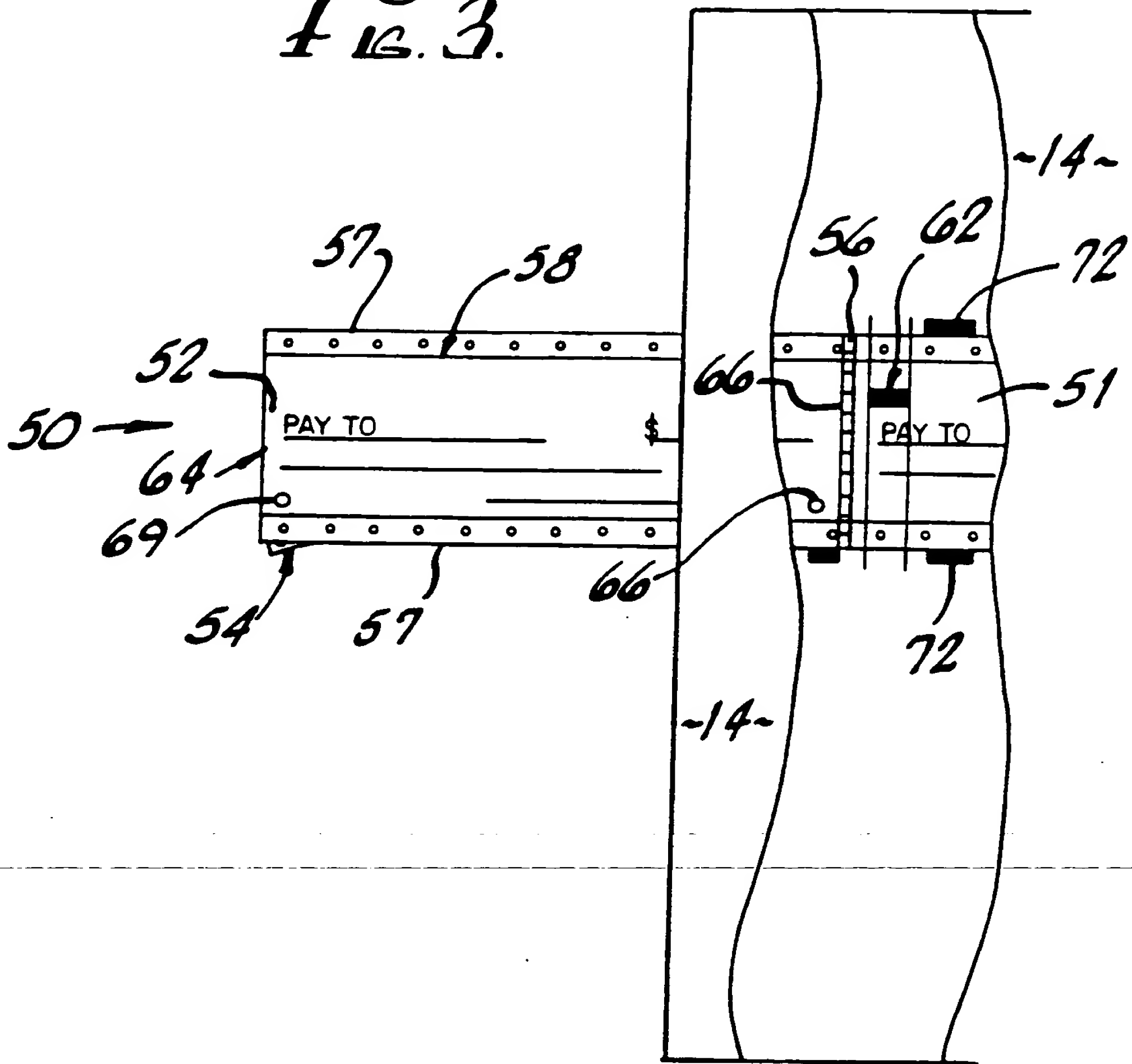charge or debit amount.

fig. 1.

fig. 4.

fig. 5.
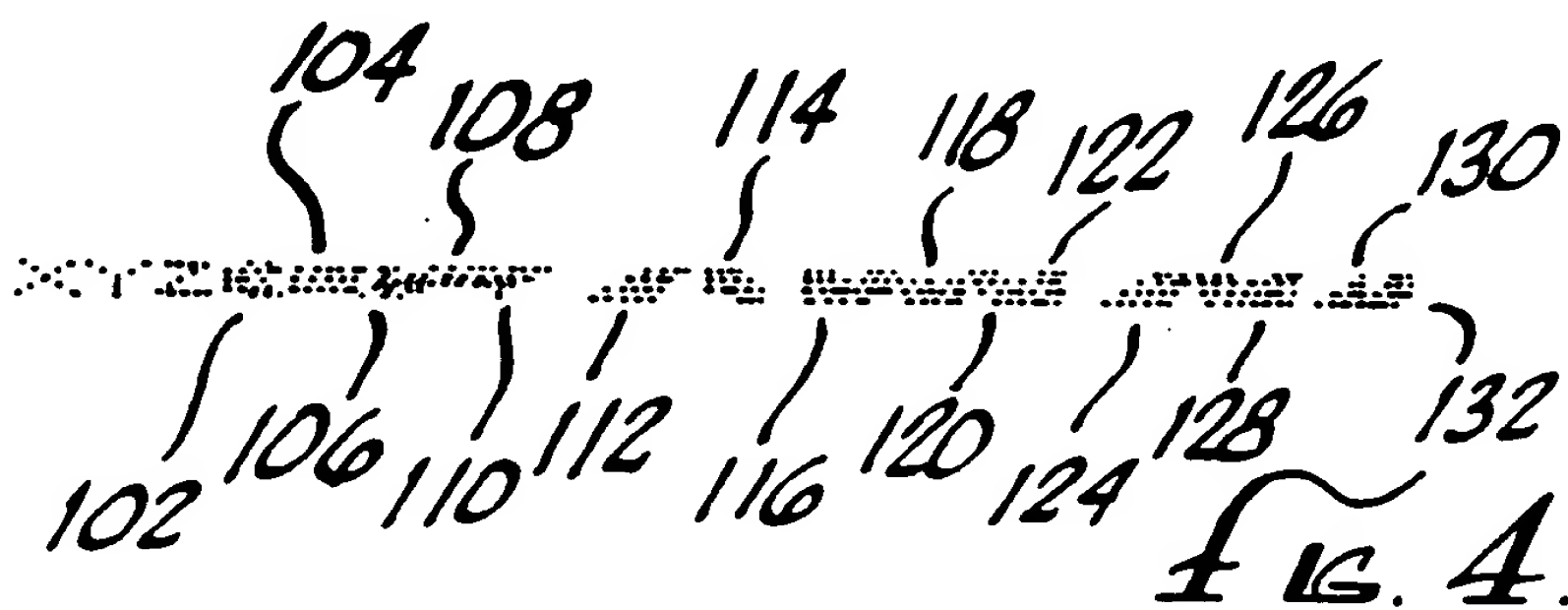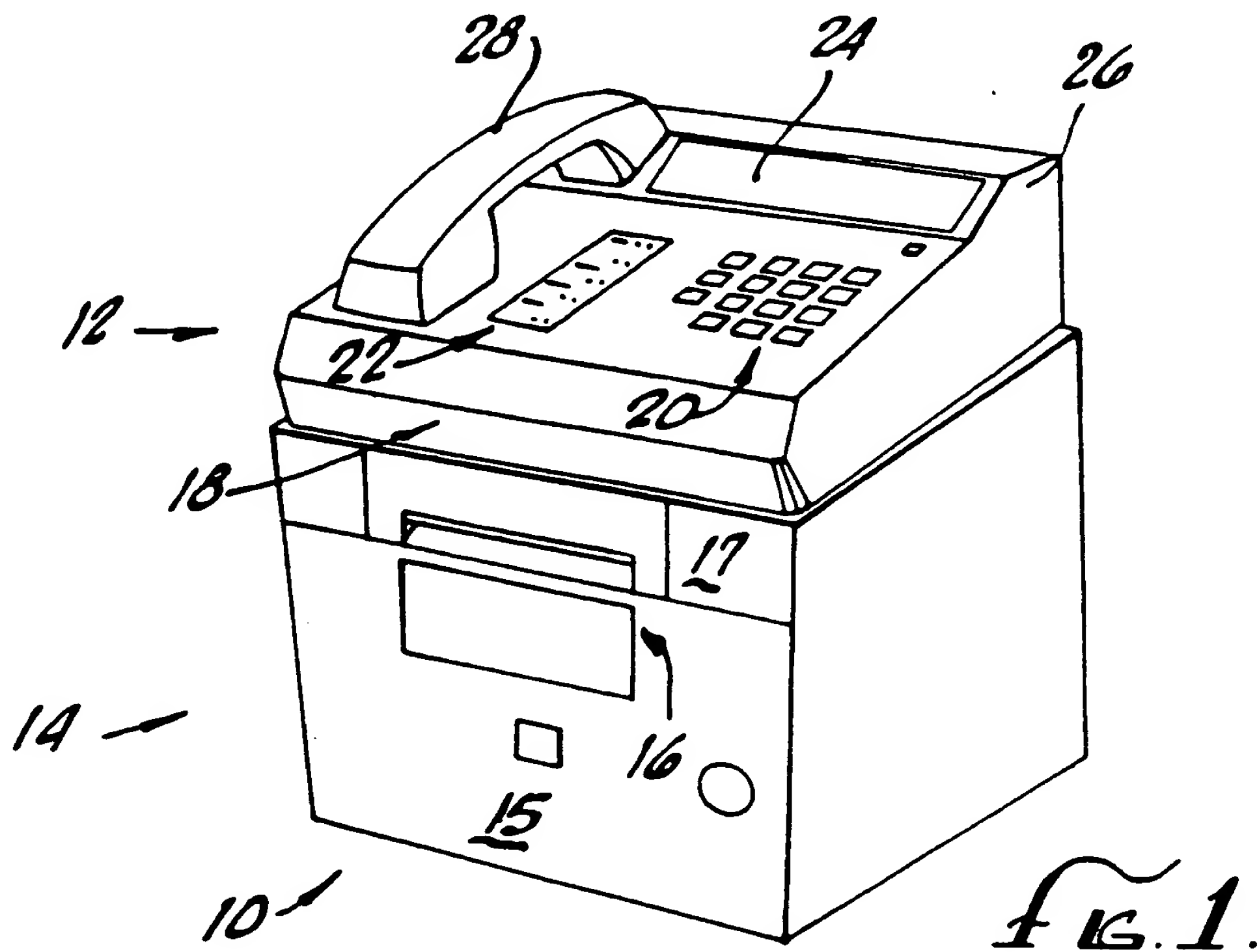
_fig._2.

FIG.3.

FIG.6.

INTERNATIONAL SEARCH REPORT

A.	CLASSIFICATION OF SUBJECT MATTER

IPC(5)   :G06F 15/00
US CL   :235/381, 235/379

According to International Patent Classification (IPC) or to both national classification and IPC

B.	FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. :   235/381, 235/379; 235/380, 381; 364/479, 468

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C.	DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4,970,655 (WINN ET AL.) 13 November 1990. See the entire document.	1-14

☐ Further documents are listed in the continuation of Box C.   ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be part of particular relevance

"E" earlier document published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 JANUARY 1993	22 JAN 1993

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Form PCT/ISA/210 (second sheet)(July 1992)